






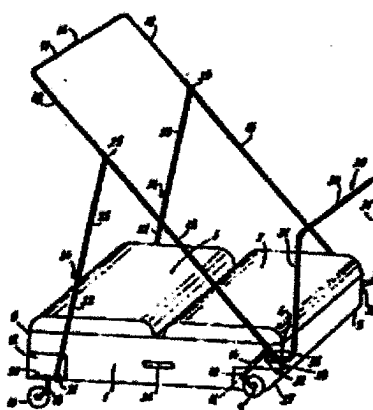


Luggage which can be converted into a trolley**Publication number:** FR2598897 (A1)**Publication date:** 1987-11-27**Inventor(s):****Applicant(s):** CHOMARD BERNARD [FR]**Classification:****- international:** **A45C9/00; A45C5/14; A45C9/00; A45C5/00;**
(IPC1-7): A45C9/00; A45C7/00**- European:** A45C5/14R**Application number:** FR19860007845 19860523**Priority number(s):** FR19860007845 19860523**Also published as:** FR2598897 (B1) JP62200929 (U)**Cited documents:** EP0142770 (A1) FR2072059 (A5) DE831589 (C) US3178197 (A) GB2124589 (A)**Abstract of FR 2598897 (A1)**

This luggage, similar to a suitcase, can be transformed into a trolley which can run over the ground and carry other items of luggage or various objects. A main element 1, receiving two pivoting closure elements 2, 3, is equipped laterally with two pairs of retractable castors 9, 10 and supports an articulated guiding and pulling system 15, 16, 22, 23. Unfolding of this system gives rise to the exit of the castors 9, 10 whilst its folding-up is accompanied by retraction of the castors.



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"Transformable Piece of luggage out of carriage"

The present invention relates to a piece of luggage, similar to a bag, which can be transformed into a carriage, to facilitate the displacement of the piece of luggage on the ground and to transport optionally, on the carriage thus formed, of other pieces of luggage or various objects taken along on a journey. The transformable character of this piece of luggage also makes it possible to give him different configurations, starting from the same elements, so as to obtain various presentations, provisions and capacities, according to the desired use.

At the time of the voyages, the pieces of luggage must often be transported by their owners at enough substantial distances, for example on quays of stations or in halls of airports. Carriages are sometimes placed at the disposal of public for this purpose, but such carriages do not exist in all places, and they can be of insufficient number in the event of large multitude. There are in addition provided bags of casters, and particularly of the bags provided with four casters, which can be displaced on the ground into rolling in a position "upright"; such a position is not very stable and these rolling bags are difficult to guide with precision. One knows also devices "luggage stand", provided with two casters, which adapt on a bag and make it possible to make it roll, but these devices increase the obstruction of the bags unnecessarily, when they are not used. Moreover, all the existing devices which make it possible to make roll a bag on the ground, do not make it to the user any possible to discharge from the other pieces of luggage or transported objects.

The invention eliminates all these disadvantages; by providing a transformable piece of luggage out of carriage, this piece of luggage being essentially made up of a rigid main element, of parallelepipedic general form, which receives at least a movable fuel element and which is provided laterally with two pairs of retractable casters, associated a deployable and foldable system of guidance and traction by the user, such as the unfolding of this system causes the extended one of the two pairs of casters, while its retraction is accompanied by the retraction of the aforesaid casters.

In folded position, the system of inscribed guidance and traction in the obstruction of the piece of luggage, which can then be carried or stored as if it were about an ordinary bag. In unfolded position, the unit form a carriage, with a kind of monopiece plate consisted the main element, two pairs of casters, and a formed steering gear by system of guidance and traction deployed. The casters allow displacement on the ground of this carriage, formed by the piece of luggage itself, on which other pieces of luggage or various objects can be placed to transport, which makes it possible the user to discharge fully from its pieces of luggage, when it must traverse with foot a relatively substantial distance. The passage of the folded position to the unfolded position, or conversely, is single and quick, and does not require any complementary manual operation for the extended one of the wheels or their retraction, since these functions are ordered directly by the movements of the system of guidance and traction; the transformation of the piece of luggage is thus easy, only one hand sufficient to unfold or fold up the unit.

In an embodiment of the invention, the system of guidance and traction includes/understands, each side of the main element of the piece of luggage, on the one hand an articulated arm, towards one of its ends, on an extreme area of the main element, this end of the arm being bonded to the one of the casters of the first pair, and on the other hand a formed compass of two legs articulated between them, with a first leg articulated also by an end on the other extreme area of the main element, this end of the first leg being bonded to the one of the casters of the second pair, and with one second leg of compass connected by articulation to the aforementioned arm, both arm being connected between them by a handlebar at their end distant from their articulations on the main element. Preferably, the handlebar is extensible, thanks to two legs sliding by rapport with the aforementioned arms, which makes it possible to place it in an optimum position, in height and advancing, to guide and draw, or to push, the formed carriage by the piece of luggage.

Cavities are envisaged, towards the four angles of the main element, to be used as residences with the two pairs of casters. The two casters of the first pair can be nonsteerable, while the casters of the second pair are steerable, to make it possible the piece of luggage converted out of carriage to easily describe curved ways, same of low ray. In a particular realization, the two nonsteerable casters are simply held by legs of which each one is integral of the one of the arms of the system of guidance and traction; as for the two steerable casters, those are held each one by a cover, rotary rise under a leg integral of the first leg of the one of the compasses of the system of guidance and traction.

Advantageously, casters of the first pair encase the Trent not fully in the corresponding cavities of the body main, same in position retracted, which makes it possible to only move also the piece of luggage on the ground on two casters, in an inclined position, by drawing it or pushing it by the handlebar, particularly at the time of low ways for which the complete transformation into carriage is not justified.

5th piece of luggage is advantageously supplemented by an hinged, formed bumper by at least a cross-piece connecting two lateral arms articulated on the sides of the main element, in one of the extreme areas of this one, a mechanical coupling being realized between the arms of the bumper and those of the system of guidance and traction, so that the unfolding of the aforesaid system causes the lifting of the bumper, while its retraction is accompanied by a folding back of this bumper above the main element. One lays out thus, on the side "front" of the piece of luggage used like carriage, of a bumper adapted to ensure retained transported objects.

According to another feature of the invention, the main element of this transformable piece of luggage out of carriage receives two fuel elements, each one of these fuel elements being articulated at an end of the main element. The piece of luggage is thus closed by folding back the two fuel elements on the main element, and it is open by raising these two elements. When the piece of luggage is used out of carriage, the putting in position raised of the two fuel elements carries out also two opposed walls, capable to retain the laid load on the main element. In addition, in the configuration resulting of the raising of the two fuel elements, these last defines between them a central space, which can be closed by a fourth element of section in "U", surmounting the main element. The piece of luggage is, of the kind, transformed into a kind of "container", of substantial volume.

Preferably, the articulations of the two fuel elements are carried out so as to allow a quick disassembling and a reassembly of these elements. For this purpose, the articulations are formed by hinges, mounted on the main element, of which a part has a profile in "U", while each fuel element comprises a complementary section, envisaged to be engaged in a nonpermanent way in the shaped part of the corresponding hinge.

Once removed, the two elements fuel, separable of the main body and presenting each one like a shell, can be juxtaposed and joined together to form a small auxiliary piece of luggage, kind "case".

In any case, I invention will be included/understood better using the description which follows, in reference to the schematic drawing annexed representative, as nonrestrictive example, an embodiment of this transformable piece of luggage out of carriage
Figure 1 is an overall picture, in prospect, showing an according transformable piece of luggage with the invention, in its configuration of carriage;
Figure 2 is a sight in prospect for the transformable piece of luggage for figure 1, in folded position; ;
Figure 3 is a side view of this piece of luggage, with indication of the positions of certain elements in the course of unfolding and in position fully unfolded
Figure 4 is a sight in corresponding end with figure 3, and illustrating the adaptation of a complementary element in the central space of the unfolded piece of luggage
Figure 3 is a detail of figure 3, showing particularly the articulation of a fuel element;
Figure 6 watch, for side, a feasible case by the meeting of the two fuel elements.

Like the watch the drawing, the main element I of the piece of luggage, being used as support with the other elements, present like the bottom of a bag, therefore like a hull, with a parallelepipedic general form.

This main I, rigid element, is supplemented by two fuel elements 2 and 3, in the shape of shells, which together form a kind of lid. Each fuel element 2 or 3 is articulated at an end of the main element 1, the respective pivotal axes being indicated into 4 and 3 and are located along the small sides of the main element 1.

The closing of the piece of luggage is obtained by folding back the two fuel elements 2 and 3 on the main element 1, so as to form a volume similar to that of a bag, this first configuration being indicated on figures 1 and 2. To reach inside the main element 1, at least one of the two fuel elements 2 and 3 is raised. When the two fuel elements 2 and 3 are raised, they define between them a central space, surmounting the main element 1. This central space can be closed by a fourth element 6, which present a section in form of "U" inverted and which connects the two fuel elements 2 and 3, while being connected also to the large sides of the main element 1 to delimit a kind of "container" - to see figures 3 and 4. L' complementary element 6 comprises a double wall 7,8 advantageously and can thus be used as cover with clothes. This element 6 can be stored inside the piece of luggage, in the configuration "bag" (figures 1 and 2).

The piece of luggage, whose main elements have just been indicated, is provided of a whole of retractable bearing, with two nonsteerable casters rear front 9, and two casters 10 pivotable. Each caster 9 or 10 retractable in one 11,12, is obviously, respectively envisaged towards one of the four angles of the main element 1. Casters 9 and 10 are associated a deployable and foldable system of guidance and traction by the user, who will be now described, in reference on figures 1 to 3. The axis of each caster front 9 is held by a leg 13, mounted pivotable on a side of the main element 1 around an adjacent axis 14 of obviously It corresponding. Leg 13 is prolonged beyond the axis 14, and is integral of an end of a tube 15 substantial length, which extends on a side from the main element 1. Two tubes 15 are joined together by means of a handlebar 16, formed of a crossbar 17 and two parallel branches 18 which slide in the ends of tubes 15 far away from casters 9.

The axis of each rear caster 10 is held by a cover 19, mounted rotary under a leg 20 which, itself, is mounted pivotable on a side of the main element 1 around an axis 21, adjacent from the obviously 12 corresponding. Leg 20 is prolonged, beyond pivotal axis 21, by a formed compass of a first leg 22, integral of leg 20, and one second leg 23, articulated around an axis 24 with the first leg 22. The end of the second leg 23 far away from the axis 24 is connected, by another axis of articulation 25, at a point of tube 15 located of the same side of the main element 1.

In folded position (see figure 2), two tubes 15 extend in the longitudinal direction from the main element 1, and compasses 22,23 are folded on the sides of this main element 1. Handlebar 16 is retracted, by inserting its legs 18 in tubes 15, so that it does not exceed the length of the main element 1. For these positions of tubes 15 and compasses 22,23, the casters front 9 and the casters rear 10 are retracted in their respective residences, constituted by cavities 11 and 12. The piece of luggage can be thus stored under an obstruction minimum, or be carried like an ordinary bag, thanks to a handle 26 envisaged on a side of the main element 1.

It is possible also, like the watch always figure 2, to deploy handlebar 16 at least partially (see the layout in mixed features) and to make roll the piece of luggage on the ground, only by its two casters front 9, by inclining it. This slope is made possible while envisaging, in front of the main element 1, a release 27 which allows the casters front 9, same in retracted position, to exceed slightly compared to the main element 1.

To transform the piece of luggage into carriage, tubes 15 are raised by swivelling around the axes 14, this movement being accompanied by an opening of compasses 22,23 (figure 3 showing, in mixed features, these parts in the course of unfolding). Into fine from unfolding, two legs 22,23 of each compass come one in the prolongation from other, and support tubes 15, handlebar 16 being deployed - to see figures 1 and 3.

At the time of the swivelling of two tubes 15, the movement of legs 13 is such as the two casters front 9 are extended at least partially of the cavities 11. The simultaneous swivelling of the first legs 22 of the two compasses makes leave the two casters rear 10 cavities 12, the extended one being here complete so as to allow the free rear swivelling of the casters 10. The piece of luggage is thus transformed into a genuine carriage, being able to roll on ground 28 by its four casters 9,10, while pushed or being drawn, and suitably directed using handlebar 16.

In this use out of carriage, the two fuel elements 2 and 3 can constitute a plate of receiving loading of other pieces of luggage or objects unspecified, which will be maintained laterally by tubes 15 and the open compasses 22,23. The use as carriage can also be done by raising the two fuel elements 2 and 3 - to see figure 3.

The pieces of luggage or other objects, transferred onto the carriage, will be preferably retained, with the front, by a hinged bumper 29 in the shape of clamp, composed of a cross-piece 30 and two lateral arms 31 which swivel on the sides of the main element 1, around axes 32 located in front of this element 1. In position of use, bumper 29 is raised vertically, like the watch particularly figure 1. In folded position, same bumper 29 is folded back towards the central part of the main element 1, so that its cross-piece 30 takes seat between the two fuel elements 2 and 3.

Each tube 15 can comprise, at its end near of the pivotal axis 14, a push rod 33 which, at the time of the unfolding of the system of guidance and traction, comes to rest on one of two lateral arms 31 of bumper 29, to raise this one. By adding at the end of each tube a 15 more stop 39, one obtains that the lowering of this tube 15 causes the folding back of bumper 29 above the main body 1.

Like the watch particularly figure 5, the two fuel elements 2 and 3 comprise, along their edges far away from the pivotal axes such as 4, of profiled locking 34, above which applique cross-piece 30 of bumper 29, when this last is folded back. Cross-piece 30 thus ensures the holding of the two fuel elements 2 and 3, in position folded back on the main element 1. Means of locking, with key or other, indicated very schematically in 35 on figure 3, can ensure a sure solidarisation of three elements 1,2 and 3 and bumper 29, in folded position.

Figure 5 watch still the detail of the articulation of a fuel element 2 on an end of the main element 1. This articulation includes/understands a hinge of which a part 36 is attached on the main element 1, and of which another part 37, rotary around axis 4 itself, present like a section in "U". The fuel element 2 comprises a complementary section 38, whose wing is committed in a dismountable way in the section in "U" 37. Auxiliary means can exactly position the two shaped 37 and 38 if one compared to the other one, in the longitudinal direction of these sections. The two fuel elements 2 and 3 can thus mounted or be dismounted of quick and precise manner on the main element 1.

The two fuel elements 2 and 3, being dismountable, can be used independently of the main element 1, while being juxtaposed as shown in the figure 6, to form a small piece of luggage, kind "case" or "document-case".

These fuel elements 2 and 3, just as the main element 1, can comprise all inner installations, such as: separations, pockets, straps, etc... to facilitate the arrangement, the holding and the transport of various objects (documents, clothing, usual articles of voyage,...).

As it goes without saying, and as it comes out from what precedes, I' invention is not limited to the single embodiment of this transformable piece of luggage out of carriage which was described above, as example; it embraces some, on the contrary, all the alternatives of realization respecting the same principle, whatever are particularly the constructive details, such as those relating to the articulation of the fuel elements, and whatever also particular installations or the equipment complementary to the different elements constituent of this piece of luggage.



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CLAIMS

- I. Transformable piece of luggage out of carriage, characterized in that it is essentially made up of a main element (1) rigid, of parallelepipedic general form, which receives at least a movable fuel element (2,3) and which is provided laterally with two pairs of retractable casters (9,10), associated a deployable and foldable system (13 to 25) of guidance and traction by the user, such as the unfolding of this system causes the extended one of the two pairs of casters (9,10), while its retraction is accompanied by the retraction of the aforesaid casters.
2. Transformable piece of luggage out of carriage according to claim 1, characterized in that the system of guidance and traction includes/understands, on each side of the main element (1) of the piece of luggage, on the one hand an arm (15) articulated (of 14), towards one of its ends, on an extreme area of the main element (1), this end of the arm (15) being bonded to the one of the casters (9) of the first pair, and on the other hand a formed compass of two legs (22,23) articulated between them (of 24), with a first leg (22) articulated also by an end (into 21) on other extreme area of the main body (1), this end of the first leg (22) being bonded to the one of the casters (10) of the second pair, and with one second leg of compass (23) connected by articulation (into 25) to the aforementioned arm (15), the two arms (15) being connected between them by a handlebar (16) at their end distant from their articulations (14) on the main element (1).
3. Transformable piece of luggage out of carriage according to claim 2, characterized in that the handlebar (16) is extensible, thanks to two legs (18) sliding compared to the aforementioned arms (15).
4. Transformable piece of luggage out of carriage according to the claim 2 or 3, characterized in that the two casters (9) of the first pair, nonsteerable, are held by legs (13) of which each one is integral of the one of the arms (15) of the system of guidance and traction, while the two casters (10) of the second pair, steerable, are held each one by a cover (19), rotary rise under a leg (20) integral of the first leg (22) one of the compasses of the système of guidance and traction.
5. Transformable piece of luggage out of carriage according to claim 4, characterized in that cavities (11,12) are provided, towards the four angles of the main element (1), to be used as residences with the two pairs of casters (9,10), the casters (9) of the first pair not being embedded fully in the corresponding cavities (11), same in retracted position.
6. Transformable piece of luggage out of carriage according to any of claims 2 to 5, characterized in that is envisaged, moreover, an hinged bumper (29), formed by at least a cross-piece (30) connecting two lateral arms (31) articulated (into 32) on the sides of the main element (1), in one of the extreme areas of this one, a mechanical coupling (33) 39 being realized between the arms (31) bumper (29) and those (15) of the system of guidance and traction, so that the unfolding of the aforesaid system causes the lifting of the bumper (29), while its retraction is accompanied by a folding back of this bumper (29) above the main element (1).
7. Transformable piece of luggage out of carriage according to any of claims I to 6, characterized in that the main element (1) receives two fuel elements (2,3), each one of these fuel elements (2,3) being articulated (into 4,5 respectively) at an end of the main element (1).
8. Transformable piece of luggage out of carriage according to the whole of the claims 6 and 7, characterized in that, in the folded back position of the bumper (29), the cross-piece (30) of celui-ci applique above shaped (34) envisaged out of the two fuel elements (2,3), along their edges far away from the pivotal axes (4,5).
9. Transformable piece of luggage out of carriage according to the claim 7 or 8, characterized in that the articulations (4,5) of the two fuel elements (2,3) are formed by hinges, rises on the main element (1), of which a part (37) has a profile in "U", while each fuel element (2,3) comprises a complementary section (38), envisaged to be engaged in a nonpermanent way in the shaped part (37) of the corresponding hinge.
10. Transformable piece of luggage out of carriage according to any of claims 7 to 9, characterized in that it is supplemented by a fourth element (6) of section in "U", designed to close defined central space auSessus of the element principal (I) by the two elements fuel (2,3) put in raised position, the piece of luggage being thus transformed into a kind of "container".
- It. Transformable piece of luggage out of carriage according to any of claims 7 to 10, characterized in that the two fuel elements (2,3), separable of the main body (1) and presenting each one like a shell, are envisaged to be juxtaposed and joined together, so as to form a small piece of luggage U kind "case".